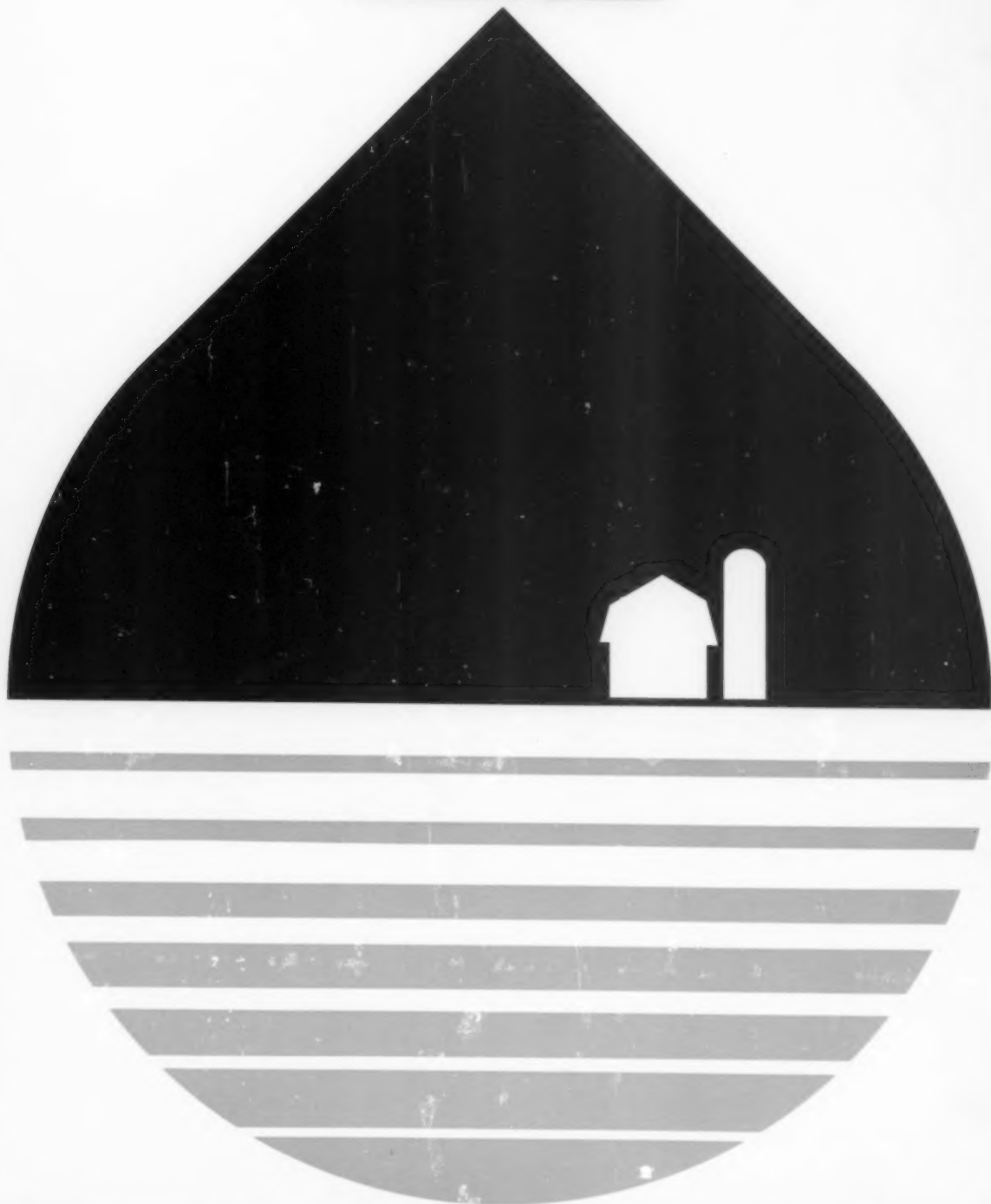


A Water Review Quarterly

RECLAMATION

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RECLAMATION



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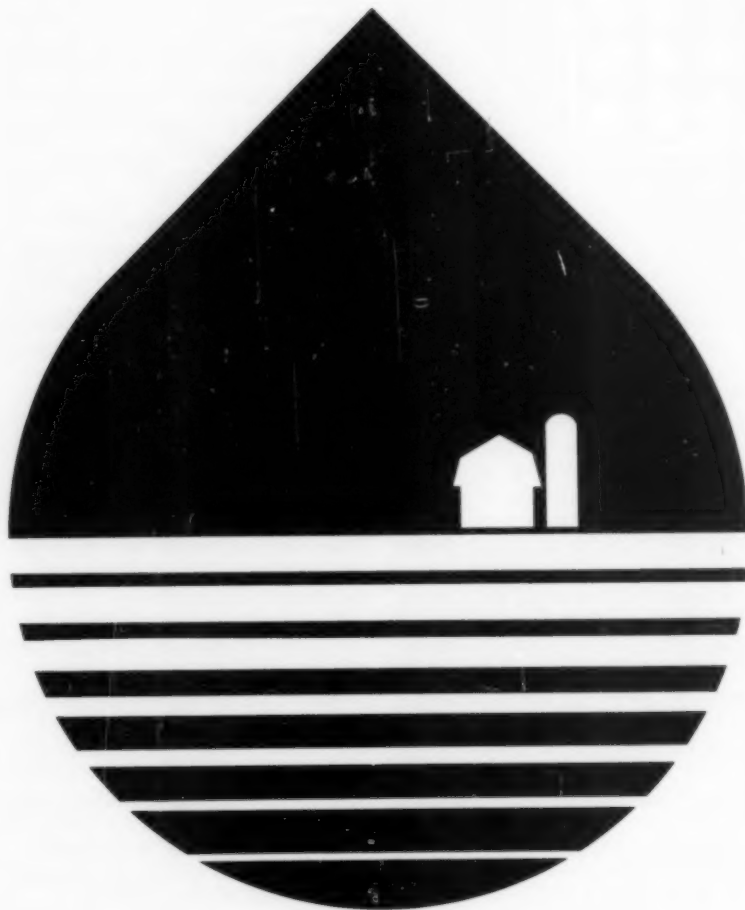
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Interior's Proposal

Acreage Limitation Policy



On May 3, 1978, the Department of the Interior submitted to the chairman of the U.S. Senate Committee on Energy and Natural Resources its recommendations concerning proposed legislation which would amend Federal Reclamation laws dealing with acreage limitation, residency, the settlement of family farmers on Federal irrigation projects, acreage equivalency, and other matters.

Following is a summary of the Department of the Interior's position on these matters as contained in the recommendations made to the Committee.

The Department strongly supports the original purposes of the Reclamation Act of 1902. It is important in this major legislative effort clearly to reaffirm those purposes. Consequently, Interior has proposed a statement of purpose, setting forth the major objectives which were embodied in the original Act and have continuing validity.

The purposes are:

- (a) to promote owner-operated family farms;
- (b) to provide opportunity for a maximum number of farmers on the land and for individuals to get a start in farming;
- (c) to distribute widely the benefits of federally subsidized Reclamation projects;
- (d) to preclude speculative gain in the disposition of excess lands; and
- (e) to provide for sound repayment practices from those receiving federally supplied water.

Eligibility

A separate section on eligibility was added, setting forth as clearly and succinctly as possible, those classes of persons who would be eligible to receive Reclamation project water. The criteria for eligible recipients of project water reflect Interior's view that the basic entitlement should center around the adult individual, without regard to family size, as has been the traditional practice. Joint ownerships would be permitted between two related or unrelated adults. Multiple

ownership arrangements would be permitted, but would be limited to owners in an immediate family.

This limitation represents an effort to recognize family multiple ownerships that have legitimate purposes but do not run counter to program purposes. It also excludes more wide-open multiple ownerships that are more difficult to monitor and control, and which tend to promote nonresident, nonparticipating, investor-type ownerships that are inconsistent with the purposes of the Reclamation program.

Residency

Most significant of the eligibility requirements is residency. The Department of the Interior considers a strong residency requirement to be the best means of assuring the owner-operated farms that are envisioned by the Reclamation program.

Section 5 of the Reclamation Act of 1902 requires that landowners receiving federally subsidized water be "bona fide residents" on the farm or in the "neighborhood" of the farm, which historically has been defined as a maximum distance of 50 miles from the farm. The Department proposes to reaffirm this requirement while allowing limited exceptions for such reasons as retirement or health.

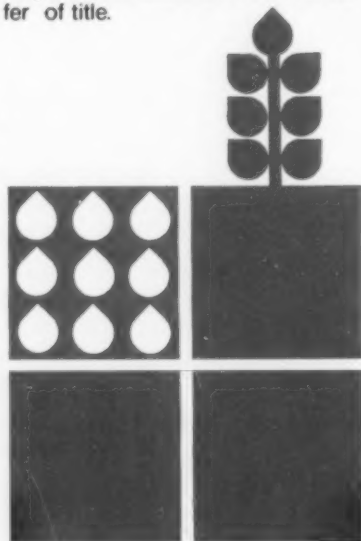
Interior recognizes that the residency requirement has not been enforced for 50 years, and hardships could be created if the requirement were reimposed abruptly. Consequently, the requirement should be phased-in gradually.

To help ease the enforcement of the residency requirement, the Department of the Interior has also recommended the following transition rules:

1. New purchasers of Reclamation project lands would be given a 3-year grace period to become residents. They would be required to declare, by affidavit, their intent to become a resident within 3 years, and thereafter to become a resident

within that time in order for their land to continue to receive project water. Affidavits would be monitored to achieve compliance. The proposed rules would allow, in addition to other sanctions, the cancellation of water deliveries for any lands involved in a fraudulent declaration.

2. Adults who now own land but are not residents would continue to receive project water for the lands, and residency would be required only of new owners at the first transfer of title.



3. Multiple ownerships held by persons in an immediate family relationship (defined as those in a direct lineal relationship with each other, spouses, brothers, and sisters) would not be required to meet residency requirements until the first transfer of title or shares, or the addition of new shareholders.

4. Corporations or other multiple ownerships holding lands that receive project water whose owners are not in an immediate family relationship would be given a 5-year transition period within which to meet requirements, to transfer ownership to eligible program participants, or to cease receiving project water.

In addition, Interior recommended that the residency require-

ment be augmented by requiring owners and lessees to be substantially involved in the farming operation. Criteria and standards for involvement would be developed later in regulations. Such criteria would be more stringent than the Internal Revenue Service definition under which periodic visits suffice for "involvement."

Acreage Limitations

The Departmental amendments to the proposed acreage limitation legislation would allow a resident adult to receive project water on 320 acres of owned land with an additional allowance for 160 acres of leased land, for a total of 480 acres (plus equivalency where authorized).

An alternative proposal would allow that as much as 480 acres could be leased by one individual receiving project water; and that any combination of ownership and leasing totaling 480 acres per individual, provided ownership does not exceed 320 acres, would be permitted. Two adults could receive project water on 640 acres of land jointly owned, or 960 acres of land jointly owned and leased. So a husband and wife, or two unrelated adults, could receive water on as much as 960 acres.

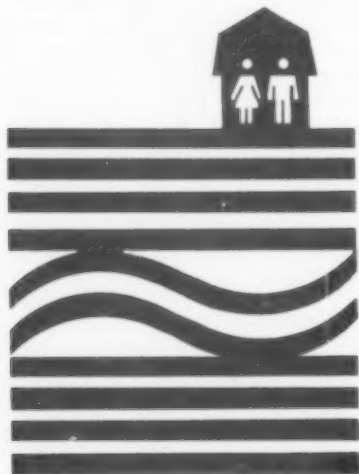
However, multiple family ownerships, such as family corporations, joint tenancies, partnerships, or trusts, where owners are resident adults in an immediate family relation, could hold up to 960 acres so long as no more than 480 acres is owned and leased on behalf of any one resident adult owner. No additional entitlement for any form of ownership would be allowed for dependent children.

New acreage limitations would apply immediately to new purchases of land, excess or non-excess. Eligible individuals having an entitlement under the current law that exceeds the limit applicable under the new bill (for instance, families with a large number of dependent children) would be allowed to keep their current entitlement. New limitations would apply on the first transfer of title or shares.

Land currently under recordable contract would continue to receive water for the duration of the contract.

The Department believes this approach strikes a desirable balance between the several objectives of the amendments:

1. maintaining the small owner-operated farm;
2. providing sufficient flexibility to allow for reasonable growth in owner-operated farms, while at the same time allowing for the considerable variations in the farm economy;



3. recognizing developments in farming technique and economics over the years;

4. recognizing to a reasonable degree the results of the history of the Reclamation program and the reliance built upon it.

The Department of the Interior does not believe that, based on current average ownerships throughout the program, the average ownership, norm, or common size of farm under our proposal would approach the 960-acre figure. On the other hand, there are enough controls in Interior's approach to prevent the establishment or continuation of large ownerships by

absentee farmers, investors, and nonfamily corporations.

Equivalency

Interior supports the application of an equivalency formula to acreage limits for projects having a growing season of 180 days or less, if requested by a vote of the district and subject to approval by the Secretary of the Interior.

The purpose of equivalency is to help assure the viability of farms on project lands where productivity is less, and to assure that owners of less productive land within a given project would not be at a competitive disadvantage compared to owners of better lands in the project.

Interior prefers the project-by-project approach, which is manageable and is consistent with past practice in the application of equivalency to particular projects. A systemwide approach, or a farm-by-farm approach, would not be manageable or equitable.

On projects where equivalency has been previously authorized, these amendments would allow the Secretary to reassess existing equivalency determinations to conform to the new overall standards of the bill. The Secretary would retain discretion under this proposal to determine what application of equivalency to a given project or district would be inappropriate, even though requested.

Leasing Conditions

Leasing can be a worthwhile device for providing access for new farmers to the Reclamation program and for providing extra income to a small farmer. Interior recognizes that leasing has been a principal device for circumventing the requirements of the law. Consequently, leasing should be carefully monitored and controlled to avoid abuses.

Both acreage and residency limitations should apply to leasing, and new purchasers of land should have to farm the land for 10 years before leasing it (subject to hardship exceptions). All new limitations to lessees of leased land would be phased in within 5 years or upon

the expiration of an existing lease, whichever is longer. Phase-in limitations for lessors would be determined by rules applicable to owners, previously discussed.

Exemption from Acreage Limitations

During the administration of the Reclamation program in the late 1940's and early 1950's, "payout" contracts were accepted policy and a number of such contracts were written. However, they are no longer supported by the Department.

But, because contracts containing payout clauses were signed in good faith by the districts concerned and had been approved by an opinion of the Solicitor, they should be honored. Future contracts containing such clauses will not be signed. Discretion of the Secretary would be retained to allow the granting of acreage exemptions upon payment of a district's obligation over the full term, if the Secretary finds that a pattern of family farms has been established.

Any exemption granted, by contract or otherwise, should be only upon full payment over the normal term of the contract. The issue has been frequently raised as to whether prepayment of the contractual obligation would warrant an exemption. The Department is strongly opposed to such a policy.

Disposition of Excess Lands

The classes of eligible purchasers from whom the seller could choose would be limited to three groups - immediate family members, tenants and employees of more than 10 years' standing, or adjoining neighbors. This classification is an attempt to strike a balance recognizing, on the one hand, several basic groups which may have a reasonable basis to receive preference for purchasing available excess lands and who, if otherwise eligible as landowners, should be encouraged by the law to participate. On the other hand, it is an attempt to keep the opportunity for purchase of

excess lands open to as many people as possible. The classifications are manageable and supportable based on past experience administering the program.

If a seller has not sold his excess lands to an eligible purchaser in one of the approved groups by the end of the recordable contract period, power of attorney would vest immediately in the Secretary of the Interior to sell the lands by lottery to an eligible purchaser. The Secretary would establish procedures and criteria for sale in regulations. The Secretary would retain discretion as to whether, or how long, to continue water deliveries to excess lands beyond the recordable contract period and during the period of sale by the Secretary.

4 Speculation in excess lands would be controlled by amending Section 46 of the Omnibus Adjustment Act of 1926 (43 U.S.C. 423(e)) to extend price control by the Secretary over the sale and resale of excess lands for a period of 15 years beyond the initial sale, and by requiring clear documentation of the legal conditions of sale in the sales transactions. Although Section 46 could be read to provide authority for price control over resales of excess lands, it has not been so interpreted until recently. For this reason, Interior believes that strengthening and clarifying Section 46 is worthwhile.

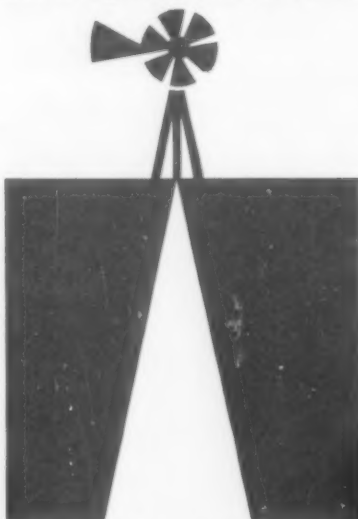
Repayment of Project Costs

The proposed amendments pertaining to repayment of project costs would require that any contracts concerning repayment for project costs or water service, including amendments or temporary contracts, entered into after enactment, would require reassessments of rates and repayment capacity every 5 years.

This would recognize several factors. Frequently, irrigation projects are built on repayment terms which are extremely favorable to the irrigators whose initial payment capacity may be small. However, as a project progresses and farms become established, repayment ca-

capacity is likely to increase substantially. If so, it is only fair that irrigators being favored with a substantial Federal subsidy assume a larger measure of responsibility. Additionally, over the course of a given project contract of 40 or 50 years, economic conditions and technology will change and inflation could substantially dilute the dollar. The reassessment provision would permit recognition of these factors.

The reassessment provision would not guarantee a rate increase



every 5 years, nor would it be one-sided. In a period of a serious economic downturn, a rate reassessment could reflect adverse conditions. In any event, reassessment provisions would be desirable.

Interior's amendments would adopt the provision that repayment for any portion of a delivery system constructed as part of a Reclamation project should commence within 1 year after that portion of a delivery system begins regularly to deliver water. This recognizes that project beneficiaries should begin repayment when the benefits of a project begin to accrue. In a number of cases serious abuses have occurred when project facilities have been in operation for a number of years, delivering benefits before repayment has commenced.

The provision also recognizes outstanding commitments for "development period" privileges allowed by Sections 7 and 9 of the Reclamation Project Act of 1939, and allows future application of those provisions in potential hardship situations.

While it is not Interior's intention to repeal or to negate those provisions of the 1939 Act, it should be recognized in current and future applications of the "development period" provisions of that law that they were written in a time of extreme economic hardship, particularly for farmers, and those conditions do not pertain today. Moreover, other programs have been developed to deal with farming economics. It may take time to initiate cash-producing crops, although 10 years may be too long.

Public Participation in Contracting

The Department of the Interior supports the concept of public participation in the contracting process, and this position is consistent with the findings and recommendations contained in the report of the Special Task Force on the San Luis Unit, published January 1, 1978, pursuant to Public Law 95-46.

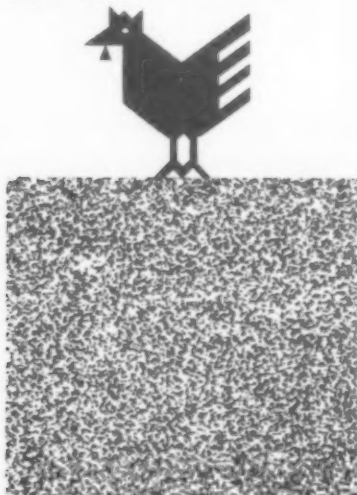
Decisions of great importance, which significantly affect both project beneficiaries and those outside the project, are made in the contract negotiation process. All affected parties should have the opportunity for knowledge of pending proceedings and for input into the process. It is also true that in the actual negotiations there may be times when direct public participation may be impracticable, or otherwise undesirable.

Our position is consistent with the recommendations of the San Luis Task Force. It would require public notice of proposed draft contracts and the opportunity for public hearings and comment. Review of comments by the Secretary and the Solicitor would also be required. Contract negotiations would be open to the public as observers; however, notice of these sessions would not be required.

Other Issues

Several other issues have been raised by provisions in bills before Congress.

One bill would establish a program whereby the Secretary would purchase excess lands and then lease them out for terms of from 2 to 7 years to qualified persons, who would be required to farm the land and meet the qualifications of a family farmer as provided in the Act. Such persons would have an opportunity to buy at the end of the lease.



While recognizing the merit in offering broader opportunities for new farmers to participate in the Reclamation program, Interior does not support this provision. Careful application of the law, with the amendments suggested relating to limits on ownership and leasing and to price control, should offer opportunities for new participants in the program at reasonable costs in the near future. A considerable additional administrative burden and cost would be occasioned by a regular program of sale, lease, and resale of lands by the Secretary, and that is unnecessary.

The same bill would call for loan guarantees by the Department of Agriculture for loans made by private lenders to qualified leaseholders, and would also require

application of various other Department of Agriculture subsidy and benefit programs to project beneficiaries under the Reclamation program. Principal policy recommendations for application of Department of Agriculture programs should be made by that Department; however, determinations for Reclamation projects should be made not by new legislation but by the Department of Agriculture on a case-by-case basis under existing authority, with appropriate participation of the Department of the Interior, with recognition of the considerable subsidies already being accorded participants in the Reclamation program.

The Department of the Interior would adopt a provision calling for an exemption for charitable and religious organizations holding project lands as of January 1, 1978, from legal limitations of the Reclamation program. Although Interior does not want to expand the participation of charitable organizations in the program since that is not the purpose of the program, the Department does not wish to eliminate from the program those charitable organizations now participating.

Interior's position adopts the provision which would authorize the Secretary, upon the request of the holder, to amend existing contracts to conform to the provisions of the bill.

An additional provision requires water districts to obtain and maintain such data and submit such reports as the Secretary may consider necessary to enforce the law.

Other Reclamation laws, not inconsistent with the new bill, would remain in full force and effect.

Departmental Regulations

It is appropriate to mention here the regulations, which would be required by Section 14 of the amendments, and which are being developed in coordination with work now underway on the environmental impact statement (EIS).

The draft regulations which were proposed last year have been substantially revised, based upon 17 days of hearings which were conducted in the West during this past winter by top policy level officials of the Department, and 10,000 written comments which were received. Additional revisions to the regulations will be forthcoming.

Pursuant to a decision of the Federal District Court in Fresno, Calif., further promulgation of rules is stayed pending completion of the EIS. The EIS will be written with reference to the rules as revised to date, not the rules as proposed last August. The timetable calls for completion of the EIS and regulations process within about 18 months.

It is clear that the EIS will increase the knowledge of potential impacts of the regulations, and of legislative amendments as well. There is substantial interest in the Congress and elsewhere to amend the law.

The Department of the Interior, through the Bureau of Reclamation, will continue to work on the EIS with the expectation that it may well offer important additional knowledge concerning alternatives for this program. When the EIS is complete, its importance for pending regulations and for any legislation which may be pending at that time or which the Administration might then consider, will then be assessed.



Journey Through Space

by Jim Joslyn

6



October 28, Eleven p.m., Southern Texas. The air was warm and humid; the ground still soggy from a recent down-pour. We worked in shirt-sleeves.

A 'possum came to visit.

He was curious—wary but seemingly unafraid. We watched as he skirted the spray of light from the floodlamp. A flashlight's beam poked at the tiny creature, hurrying him along. Finally, he topped a hillock of mud and gravel, and disappeared into the night.

The 'possum was an incongruity, a throwback from another era, for we were a millennium distant from the present, fascinated by our task. Stars painted on a night sky canvas were our kingdom. And for a few brief moments we fantasized ourselves kin to the astronauts. We were on a journey through space.

It was extraordinary—a unique experience generated by a unique experiment.

Jim Joslyn is a writer-editor, Engineering and Research Center, Denver.

And the 'possum? He proved to be our good luck omen.

Our area of work centered on television and satellites. We were specifically involved in a satellite communications experiment that encompassed a wide breadth of space age technology, a large portion of hard work, and several pairs of crossed fingers.

Satellite communications was being investigated as a method for improving the exchange of information between construction personnel in the field and the Engineering and Research Center (E&R Center) staff in Denver. It would, for example, allow design engineers to view construction progress, as well as any related problems, as it actually occurred.

A live, color television broadcast originating from the Bureau of Reclamation's Palmetto Bend damsite only 30 miles from the gulf coast of Texas was to be transmitted via satellite to the E&R Center. The entire experiment had to "live or die" during a 2-hour period on the morning of October 28, 1977.

This would be the first such experiment ever attempted by the Bureau.

The objective was quite straightforward and proved comparatively simple when measured against the technical and coordination complexities required for the experiment to take place. Many variables, including those of Mother Nature, made the chance of success somewhat like spinning the roulette wheel.

The entire experiment had to "live or die" during a 2-hour period.

The satellite experiment is the brainchild of E. R. Lewandowski, then Chief, Division of Engineering Support at the E&R Center.

Under the direction of Lewandowski, the division had developed a color videotape system similar to those used by many television news programs. This system could be transported and used anywhere in the field. Tapes recorded in the field could be viewed at a later time.

But what about a live broadcast using this system? Could it be done from a remote site several hundred miles distant using

a satellite to transmit the signal? Would it enhance communications in Reclamation?

Lewandowski decided to investigate.

The task of determining the feasibility and ultimately the task of developing the experiment fell to Larry Stephens, then Head of the Technical Liaison and Special Services Section in the Engineering Support Division. Stephens had been the principal "push" behind the emergence of the division's videotape capabilities. He enlisted the aid of Bob Walsh, a writer-editor on his staff.

Together, Stephens and Walsh opened the door to "satellite communication" for Reclamation. What they saw generated twinges of both interest and apprehension. When you're accustomed to producing pamphlets and videotapes and slide presentations, you don't often come in contact with satellites. Like Christopher Columbus, they were about to sail in uncharted waters.

However, they soon found their "launching" point, a satellite communications seminar sponsored by the Public Service Satellite Consortium (PSSC) in June 1977. The PSSC helped provide coordination for experiments such as that envisioned by Reclamation.

When you're accustomed to producing pamphlets and videotapes and slide presentations, you don't often come in contact with satellites.

After several weeks of dialogue between Walsh and the technical personnel from the PSSC, Reclamation's experiment was determined to be both feasible and valid.

An agreement was signed.

The PSSC would furnish technical and ground support. NASA would be responsible for the operation of the satellite and

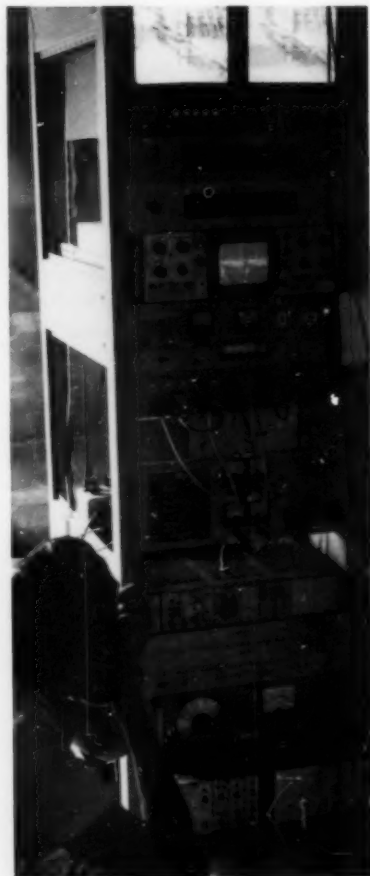
would supply the portable earth stations that transmit and receive the signals. PSSC personnel would man the earth stations (essentially mobile vans with dish-shaped antennas and all the electronics necessary for a satellite transmission).

Reclamation would furnish its color video system and the staff to operate it as well as the technical experts to "host" the program.

The Communications Technology Satellite (CTS), operated jointly by the United States and Canada, is one of the most powerful in service today. Constant use of this satellite necessitated that the experiment be scheduled several weeks in advance. A 2-hour block, 8-10 a.m. central, on October 28 was available, and became the critical time target.

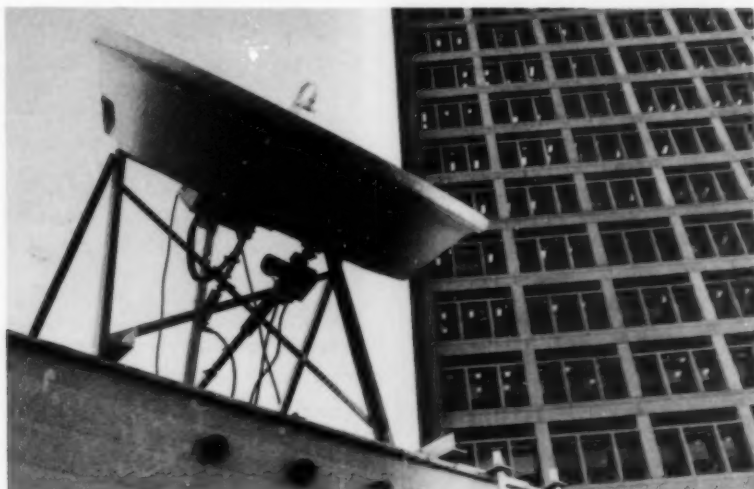
Once the date was established the experiment was coordinated with the Southwest Region and Palmetto Bend Project offices.

Palmetto Bend was selected as the transmission site for several reasons, principal among them being the unique design and the type of construction that would be underway at the time of



The broadcast was monitored inside the portable earth terminal.

Ina Fox, a member of the television crew, helped test the equipment.



The antenna of the portable earth station in Denver received signals from the satellite.

the broadcast. The dam is a horseshoe shaped earthen embankment that will stretch for 7.9 miles with a maximum height of 65 feet. Its massive concrete spillway is 400 feet wide and at one point dips to 14 feet below sea level. Located on the Nueces River about 30 miles from the Gulf Coast, the dam will be subjected to torrential rains, flooding, and tidal fluctuations.

Palmetto Bend Dam is not only of unique design, it is located in

an interesting area, especially if you happen to be a "northerner" from the semiarid climate of Denver (the engineers, video crew, and PSSC personnel were all from Denver).

The rain, humidity, and warmth common to southern Texas created a wet, lush environment perfect, it seems, for a variety of creatures.

Alligators (reportedly measuring up to 10 feet) and all four species of poisonous snakes in-

digenous to the United States—the rattlesnake, cottonmouth, copperhead, and coral—reside in the project area.

Construction personnel made sure that Walsh and Stephens returned with this unsettling tidbit of information from a September reconnaissance trip to the site. Needless to say, everyone donned high boots for the experiment. Fortunately, no reptilian inhabitants were encountered during the experiment.

Stephens' and Walsh's September investigation of the site revealed more than just potential health hazards. The live telecast would require additional and specialized equipment. At various times the cameras would be up to 300 yards from the transmitter. Extra audio and video cables, an amplifier to boost the signal over the extreme cable distances, and special microphones would be needed. And a system using walkie-talkies had to be devised to enable communication between the earth station and the camera operators.

During the weeks prior to the experiment, numerous equipment and coordination problems had to be solved. As usually

10 happens, the calendar dictated the pace.

The experiment was scheduled for October 28, but on the 26th an onsite test of the earth stations, the satellite, and our television system would be attempted. This test would reveal whether the actual experiment could even take place. All the pieces of the puzzle would have to fit perfectly.

The countdown began.

October 24, 5 a.m., Veteran's Day. Walsh and I (Joslyn) left Denver, heading south on Interstate 25. We were shepherds to a van full of fragile electronic television equipment. The balance of our video crew, Stephens and Ina Fox, would fly down the next day accompanied by Ed Rossillon, Lloyd Gebhart, and Luther Davidson, representing the Division of Design and Construction at the E&R Center. The latter three served as "technical consultants" for the content of the program and would help provide expert narration during the broadcast.

The drive was long but interesting. Near Raton, N. Mex., we turned southeast. The backdrop of the Rocky Mountains faded.



Technician Bob Dusek surveys the area from the portable earth station.

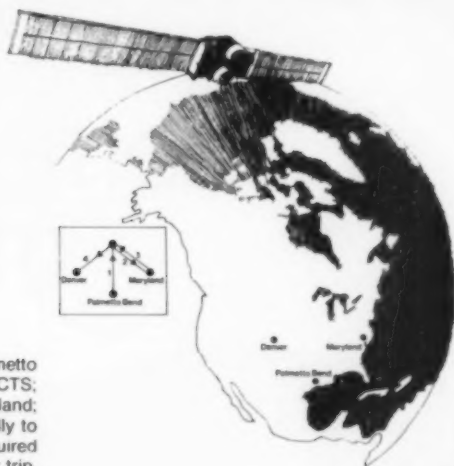


Equipment used during the broadcast.

Traveling through dry, flat, western Texas, we passed by thousands of acres of cotton being mechanically harvested. Abilene was our nightstop.

Thick fog, a frequent occurrence in this part of Texas, accompanied our early morning departure on the 25th. As we traveled further south, the landscape greened and the monotony of the unchanging horizon gave way to forested, rolling hills. Fine, brick country homes mingled with tired, sagging shacks.

By midafternoon we were some 1,100 miles from Denver. After a brief stop at the Palmetto Bend project office in Edna, we



The Signal, which originated at Palmetto Bend, was transmitted: (1) to the CTS; (2) then to a computer in Maryland; (3) back to the CTS; and (4) finally to Denver. About 1/2 second was required for the 142,000 kilometer trip.

traveled to the damsite.

The NASA earth station had already arrived.

Pumps labored to rid the spillway area of brown water still standing from a downpour 2 days before. We hoped Mother Nature would provide us dry weather until 10 a.m. Friday.

Wednesday, October 26. It was still dark as we readied the equipment for the early morning test. A second NASA earth station, similar to the one at the damsite, was parked outside the E&R Center in Denver. Cables ran from the van, up the side of the 14-story building, to monitors on the top floor. There, top officials and others from the E&R Center would view the Friday morning broadcast.

Our television system worked perfectly. The signal from our camera traveled via cable to the earth station parked on a bluff overlooking the spillway.

Now for some nail-biting.

The signal would be transmitted from the earth station to the satellite some 22,000 miles overhead, then to a NASA computer in Maryland. From Maryland the signal would be relayed back to the satellite and finally to

the receiving earth station in Denver. The journey would cover an incredible 88,000 miles in about 1/2 second.

But the transmitter was unable to locate the satellite.

Through the morning fog the sunrise glowed brilliant orange. The test time passed. No success. We tried to mask our anxiety.

The journey would cover 88,000 miles in about 1/2 second.

Then a bit of luck! The PSSC was able to reschedule the test for 10 p.m. that night.

Later Wednesday morning the television team and the engineers from the E&R Center met with project personnel. Bob Towles, Project Construction Engineer, offered total support for the experiment. Two of his staff, Jim Lane, Office Engineer, and Don Barron, Chief Inspector, topped the list of several project people whose assistance would prove invaluable.

During Wednesday afternoon the PSSC technicians struggled with the transmission problem.

Finally they decided that a malfunctioning compass had caused misalignment of the antenna. A project crew surveyed a precise line. The earth station was turned slightly and the antenna realigned.

In the remaining daylight hours the television crew taped background footage in the spillway and at the batch plant. As the evening shadows lengthened, the lighting became inadequate for taping. We stopped for dinner.

At 8 p.m. we regrouped to prepare for the 10 p.m. test. The night began quiet and warm. The construction equipment sat silent. High intensity spotlights were necessary to produce an adequate light level for our color cameras. In the earth station, the generator that powered the transmitter spurted to life and began its steady hum. Ten p.m. passed. Ten-thirty.

Then our little friend, the 'possum, made his appearance. The distraction eased our tension. He brought us luck.

The signal from the realigned antenna groped in space. Suddenly, the monitor in the earth station showed vague color bars.

It was the CTS returning the signal. Our spirits were instantly rejuvenated.

A minor correction to the antenna angle. The output wattage level was adjusted. The transmitter locked in. Then more problems; these beyond our control. First the computer in Maryland, then the receiver in Denver.

We waited.

Finally, after many minutes of apprehension, Denver had video. Then audio.

It worked!

We were elated and relieved.

As our image flashed across that vast distance, our thoughts drifted to the ethereal. For a few brief moments we dwelled with the stars, we were cosmic beings. One second in Southern Texas, the next in Denver. Miraculous!

It worked!

Back to earth. The test was a success. We felt the fatigue. It was 1 a.m. Our day had been 20 hours long.

October 27. This was as close to a normal day as we would have. It was devoted to taping

more background footage.

Walsh and Fox flew the area, taping an overview of the entire Palmetto Bend Project. Stephens and I went on a safari, taping reservoir excavation, embankment placement, and soil testing from the back of a pickup truck. The day ended appreciatively uneventfully. Friday would be hectic. The weather forecast revealed a chance of rain which could prove disastrous to the broadcast.

D-Day arrived. October 28, 1977. Again we were up early. Again a brilliant orange sunrise. Again our luck held. Vehicles dripped from the humidity—but no rain.

Walsh would operate one camera from the spillway area. Fox would broadcast first from the computer shack at the batch plant and then move to reservoir excavation. Stephens would direct the entire affair and operate the switcher which would determine whether the picture viewed in Denver was live or a prerecorded tape. Me? I just worried.

We would work from a predetermined shooting script. The timing would be ridiculously critical, if not impossible. It caused

jumpy stomachs.

8 a.m. Denver was having problems receiving again. Minutes seemed to race by.


Then, about 8:25, "We're on the air live from Palmetto Bend damsite near Edna, Texas." The broadcast was underway.

The television team experienced a frenzied 1½ hours. On camera, Towles led off with an introduction of the project. Prerecorded tapes were interspersed with live scenes from the spillway, batch plant, and reservoir. Construction personnel and the visiting engineers discussed each situation. Two-way audio enabled the personnel at the E&R Center to ask questions of those at the damsite.

And then, 10 a.m., it was over.

The experiment was a success. We had bested the odds. However, evaluation of this experiment indicates that it will be some time before Reclamation will be able to put live satellite broadcasts to use.

One p.m. Friday. The van was once again loaded and fueled. Our bags were packed. Walsh and I faced a long drive back to Denver.

We didn't mind. 

Habitat Improvement Program

by Sue DeShazo

13





Old tires provide a home for fish in Torn Steed Reservoir.



A weed trap and game escape ramp on the Kutz Siphon, Navajo Indian Irrigation Project.

- 14 Enhancement of fish and wildlife habitat is an increasingly important product of multiple-purpose water resource projects constructed by the Bureau of Reclamation. During calendar year 1976, the Southwest Region alone recorded more than 7 million visitor-days at recreation areas on Reclamation projects. Over 1 million of those visitor-days were reported for fishing.

Advance planning is the key to a successful habitat improvement program. The Southwest Region regularly consults with Federal, State, and local agencies involved in fish and wildlife—during the planning stages, construction, and operation and maintenance.

Reclamation has made lands available to States for wildlife management purposes and conducted selective clearing programs to preserve fish habitat. The Southwest Region has provided fish shelters, fish barriers, nesting habitat for birds, and animal escape facilities in canals

Sue DeShazo is a public information specialist in the Southwest Region, Amarillo, Tex.

to improve the environment for fish and wildlife, and is continuing to conduct research to aid in the preservation of fish and wildlife resources and plant life.

The San Juan-Chama Project, an example of this research, is a complex network of dams, siphons, and tunnels that transports water from the mountains of Colorado to the Rio Grande in New Mexico, providing several opportunities for fish and wildlife habitat enhancement. Just last year, the Southwest Region helped the State of New Mexico acquire a game management area. The United States provided funds for the purchase of almost 8,000 acres of ranch land in northern New Mexico, primarily for the mitigation of elk and other big game losses resulting from the project.

Water from the San Juan-Chama Project has made it possible to establish permanent pools for recreation and fish and wildlife at Elephant Butte and Cochiti Reservoirs. The water designated for these pools cannot be released for other purposes so the resulting minimum pools conserve the fishery during extreme low water periods.

A permanent trout barrier has been constructed on Rio Nambé Falls Reservoir to protect a remnant population of the New Mexico cutthroat trout—an endangered species. The 4-foot-high retaining wall that stretches across the stream is built of natural rock with a concrete, steel-reinforced crest. The barrier prevents rainbow trout from migrating upstream and hybridizing the cutthroat trout.

A ¾-inch mesh polyvinyl screen has been installed across the outlet of Cutter Dam, Navajo Indian Irrigation Project, N. Mex., to prevent fish from escaping into the Main Canal. The canal carries irrigation water to Indian lands and crosses many miles of rugged mountain-desert terrain en route. The canal has been equipped with dirt crossing bridges, ladders, and escape ramps to prevent the loss of big game animals. A 2-year study is underway to determine if these facilities are adequate.

For years, deep sea divers have found marine life abundant around undersea wrecks, drilling rigs—anything that could provide a home for the many marine species. With this thought in



Dirt covering on crossing bridge is intended to encourage animals to use bridge.




Reinforced natural rock barrier on Rio Nambu Creek prevents upstream migration by rainbow trout.

mind, the Oklahoma Department of Wildlife Conservation and local bass clubs embarked on a fish habitat improvement program at the newly constructed Mountain Park Project, Oklahoma. Old tires instead of a lost ship are the framework of the new housing development in the bottom of Tom Steed Reservoir. More than 2,000 old tires were hauled to the lake by the volunteer bass boosters, tied in pyramids 50 to 60 feet long, and placed in the lake bottom.

A similar plan is being undertaken by the Southwest Region on the Palmetto Bend Project now under construction in Texas. Where clearing has been required, the contractor has been instructed to stack the brush to make shelters for fish concentration sites. In addition, ponded areas are being retained for fish rearing, and the Bureau of Reclamation has agreed to a closure date for initial impoundment of water which will aid in establishing fish populations before nongame fishes predominate.

Waterfowl nesting is encouraged around Reclamation reservoir areas. The most recent enhancement activity is on the Middle Rio Grande Project in New Mexico where two ponds are being readied to receive water during the nonirrigation season for a waterfowl nesting area. The ponds will mitigate losses for right-of-way required through a wildlife refuge for extension of a drain unit. Wildlife refuges are located adjacent to many Reclamation reservoirs in the Southwest Region.

To ensure the availability of opportunities for the outdoor-oriented American in the future, the Bureau of Reclamation will continue to seek ways to enhance the environment for fish and wildlife—in the Southwest Region and throughout the 17 Western States. 

Yesterday and Today in the ERA



16 Yesterday 1947 Who's Hungry Now?

With massive Hungry Horse Dam about ready to become a leading figure in western Montana's economic life, an enterprising Columbia Falls newspaperman decided it was high time to make a few discreet inquiries into the giant's parentage. Specifically, he set out to learn for whom the structure, and the small creek which flows into the South Fork of the Flathead River at the damsite, were named.

It should never have been a secret. Hungry Horse Dam and the creek which bears the same title were named after two fine horses—Jerry and Tex. Years ago, in the winter of 1900-01 to be exact, David and William Prindiville were freighting oil drilling equipment from Belton, on the Great Northern main line,

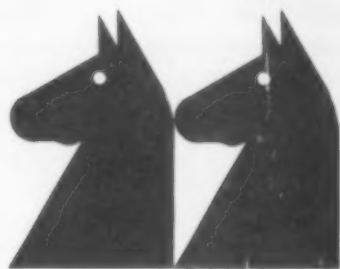
to a spot up the Flathead's North Fork, where there was an oil rush on at the time.

One day they had just crossed the South Fork of the river on their way to Columbia Falls when they discovered that two horses—Jerry and Tex—were missing. A month later, the horses were found belly-deep in snow and "nothing but skin and bones." A trail had to be broken and oats fed to the horses before they had strength enough to walk out.

Thus the name Hungry Horse. But the story has a happy ending and both Jerry and Tex, like their namesake to be, performed valuable services to the community. For many years Jerry pulled a Kalispell fire engine, while Tex drew a delivery wagon for the Kalispell Mercantile Co.



The dam under construction.



Hungry Horse Dam

Today

Hungry Horse is a key project in the multiple-purpose development of the water resources of the vast Columbia River drainage basin.

At the time of completion, Hungry Horse Dam was the fourth largest and fourth highest concrete dam in the world. The dam, an arch-gravity type structure, has a crest 2,115 feet long. The elevation of the crest of the dam is 3,565 feet above sea level.

The dam forms a reservoir ap-

proximately 34 miles long, with a maximum width of $3\frac{1}{2}$ miles, and a capacity of 3,468,000 acre-feet equivalent to about 5,300 gallons for every inhabitant of the United States. The maximum depth of the reservoir is 50 feet, and its surface area is 37 square miles.

Hungry Horse Dam contributes materially toward controlling floods on the Columbia River. The dam helps minimize floods in the Flathead Valley and reduces peak discharges between the valley and Grand Coulee Dam by 10 to 25 percent,

and at Portland, Oreg., by about 5 percent. Approximately 3 million acre-feet of Hungry Horse Reservoir storage capacity can be used for flood control.

A study is now being conducted to evaluate the provision of additional generating capacity at the existing Hungry Horse Powerplant, including a new downstream reregulation dam. The existing powerplant capacity of 285 megawatts (MW) could be increased to about 485 MW. The need for new recreation facilities and areas will be studied. Fish and wildlife, flood control, and water quality aspects will also be considered, particularly with regard to the operation of the reregulating reservoir to improve the stream-flow regime of the Flathead River downstream.

The Hungry Horse Reservoir offers excellent opportunities for fishing, boating, water skiing, and swimming. The surrounding mountains are popular big-game hunting areas. The Forest Service administers the recreational development of the reservoir area and has constructed numerous campgrounds and picnic areas around the reservoir.

SOLAR-HYDRO TIE

Editor's Note:

Remarks of R. Keith Higginson,
Commissioner of Reclamation, prepared for "Sun Day," Wednesday,
May 3, 1978, Washington, D.C.

- 18 The Bureau of Reclamation in the Department of the Interior is a lead agency in solar energy development. It is planning to integrate utility-sized wind-turbine generators into the Federal transmission system. It is advancing the concept of large solar powertowers. This is possible because Reclamation is today the principal producer of solar-derived electric power. Reclamation, of course, is a hydroelectric agency, and hydro is solar. The 49 hydroplants built and operated by Reclamation currently produce 42 billion kilowatt-hours of electricity a year.

Hydro, like other forms of solar energy, uses a renewable resource . . . energy from the sun. There is no air or water pollution, no radiation hazards.

It is the sun that evaporates water from land and sea, drives the winds and brings rain to mountain watersheds. Solar energy is stored in this water, to be released as it falls through hydro turbine-generators. There

is no other way to store large quantities of electric energy except in water in reservoirs or running downhill in streams. This energy can be stored and then released almost instantly as it drops through turbines. Sometimes water can be pumped back uphill to a reservoir when there is a surplus of electric pumping energy, and then released to again generate power during periods of peak demand.

Reclamation is a hydroelectric agency, and hydro is solar.

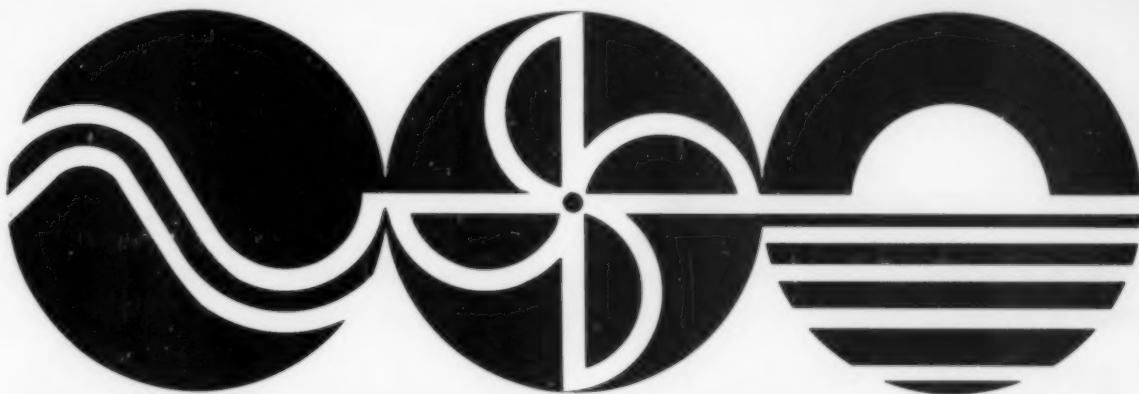
Since hydro can go on the line instantly, it makes all other forms of electric energy more efficient and economical. Peaking with hydro allows electrical delivery systems to meet variable demands, especially during high-use periods such as break-fast time and early evening dinner hours.

Steam and nuclear plants have lengthy start up time and turbines must be kept spinning to meet any unexpected peak loads. Hydro, on the other hand, by meeting peak demands can

be used to firm up the base loads provided by these fossil-and-mineral-fueled more costly powerplants.

Hydro not only brings reliability and economy to conventional energy systems, it makes possible the use of other kinds of alternate, intermittent solar energy. It makes potential development of both solar powertowers and wind turbine generators appear technologically and economically optimistic. These new utility-sized powerplant concepts would derive their energy directly from the sun, but since the sun is a 9-to-5 operation or may go behind a cloud, or when the winds die down, an inter-connection to a large hydroelectric system keeps the energy flowing on the line.

In a giant hydroelectric system like Reclamation's, which is tied together with a network across the Western States totaling 16,000 miles of Western Area Power Administration transmission lines, and with ties to a large number of other public and pri-



vate power systems, it becomes feasible to locate wind or other solar powerplants where the sun or wind is strongest. These interconnections also make out-of-the-way siting of plants more aesthetically and environmentally desirable.

Since hydro can go on the line instantly, it makes all other forms of electric energy more efficient and economical.

Energy from hydro can be greatly increased even without building any new dams, because it is possible to rewind old generators at existing powerplants or add new generators where none now exist. Adding additional hydro capacity in this manner is by far the least expensive way to build new electric capacity. The costs average out to a few hundred dollars per kilowatt of installed capacity,

as compared to perhaps \$1,500 or much more for fossil-fuel burning plants or nuclear plants.

In addition, the Nation could make use of perhaps 40,000 to 50,000 small or low-head existing dams and water-control structures to build small-scale powerplants. With the high cost of today's fossil fuels and uranium the economics of these low-head plants are very favorable. We think that by all these means hydroelectric capacity in this country could be increased by at least a third, or even doubled.

So you can see why I speak of Reclamation as a principal source of solar energy today; Reclamation is one of the lead agencies in utility-sized solar energy because of this solar-hydro tie.

We are obligated by treaty and law to build a plant near the Mexican Border to reduce

salinity in the Colorado River. This plant will require a great deal of energy and Reclamation has advanced the concept of building a 200-megawatt solar power tower near Yuma, Ariz.—one of the sunniest places in the Nation—to produce electric energy and process heat.

We also have a proposal for installing 49 wind turbines near Medicine Bow, Wyo.—an area of sustained, high winds—which could add 98 megawatts of installed electric capacity. This wind energy would be integrated into Reclamation's hydro system and make more efficient use of winter and spring runoff by holding it back to use for increased peaking capacity.

Because of our experience with underwater electric transmission cables, concrete construction, and giant pumps, the Department of Energy is exploring with us some of the problems of constructing huge floating ocean thermal systems. While these are utility-sized solar generating plants, our involvement would probably be in an advisory capacity only. **CE**

elephant butte dam

A National Historic Civil Engineering Landmark

20



These 26-ton valves were the world's largest when constructed in 1912.



The three towers were part of a cable system used at the Elephant Butte damsite to lift construction equipment across the Rio Grande.

Elephant Butte Dam, a long-time New Mexico feature, has been designated as a National Historic Civil Engineering Landmark. The dam has drawn visitors and provided benefits for Rio Grande Valley residents for more than 60 years. This dam created the largest reservoir in the world at the time it was completed in 1916, and is still the largest and most visited man-made lake in the State of New Mexico.

The dam is located 5 miles northeast of Truth or Consequences, N. Mex., on the Rio Grande and the reservoir is one of two storage facilities for the impressive Rio Grande Project. The other storage reservoir, Caballo, was completed in 1938 and is located 25 miles downstream. The Rio Grande Project is still operated by the Bureau of Reclamation from a project headquarters in El Paso, Tex.; two irrigation branches in Ysleta, Tex., and Las Cruces, N. Mex.; and a power branch at Elephant Butte.



The Rio Grande Project was among the first to receive attention soon after passage of the Reclamation Act of 1902. Investigations were started in 1903 and a feasibility report was issued in 1904. On February 25, 1905, Congress authorized construction of a dam and reservoir on the Rio Grande to impound flood waters and provide irrigation water to valley lands in New Mexico and Texas.

Congress subsequently appropriated \$1 million of non-reimbursable funds to provide 60,000 acre-feet of water annually to the Republic of Mexico. In return, the Mexican Government, by Treaty of 1906, waived all claims to water in the Rio Grande above the town of Fort Quitman, Tex., and all claims for past damages from the shortage of water. This was the first civil engineering structure to affect the international allocation of water.

Project construction was initiated in 1906 with the building of Leasburg Diversion Dam and Canal. Other canal and diversion rehabilitation was undertaken to improve irrigation service while the Reclamation Service

(now Bureau of Reclamation) negotiated for the lands required. Construction of Elephant Butte Dam started in 1912 and was completed in 1916.

ASCE officially designated Elephant Butte Dam as a National Historic Civil Engineering Landmark on March 25-26, 1977.

Formal dedication of Elephant Butte Dam was on October 19, 1916, under the auspices of the International Irrigation Congress. Over 60 years later another dedication gave further recognition to the huge structure. The American Society of Civil Engineers (ASCE) officially designated Elephant Butte Dam as a National Historic Civil Engineering Landmark on March 25-26, 1977. Appropriately, ASCE is the oldest national professional engineering society in the United States, founded in 1852.

In addition ASCE lauded three Reclamation civil engineers who had major responsibilities for Elephant Butte Dam: Arthur P. Davis, who was Director and Chief Engineer of the Reclamation Service; Louis C. Hill, design engineer; and E. H. Baldwin, construction engineer, who later became senior engineer on the project and then project manager. Davis was president of ASCE in 1920 and Hill in 1937.

The dam was first called Engle Dam but was changed to Elephant Butte because of the large distinctive butte, now surrounded by water, which looks very much like an elephant. Elephant Butte Dam is a concrete gravity structure spanning 1,674 feet and rising 301 feet. The top width is 18 feet while the maximum base width is 328 feet. The reservoir has a total capacity of 2,137,219 acre-feet of water covering more than 36,000 acres, with 250 miles of shoreline.

In addition to the two storage reservoirs, the project has four diversion dams to divert the water into the more than 600 miles of canals and laterals for ultimate delivery to about 5,000 farms along the Rio Grande.

Elephant Butte Dam,
the spillway, and powerplant.



- 22 Along with the irrigation water delivered, Elephant Butte Dam and Reservoir provide municipal water, electric power, flood control, recreation, and fish and wildlife benefits.

Hydroelectric power from Elephant Butte Powerplant, which was completed in 1940, is furnished to five cooperatives through a large generation and transmission cooperative and to a municipality. The power system consists of Elephant Butte Powerplant with a nameplate rating of 24,300 kilowatts, 448 miles of 115-kilovolt transmission line, and 10 substations.

Recreation is an important byproduct of the project. The State of New Mexico operates parks at both Elephant Butte and Caballo Reservoirs and has excellent public use facilities. Approximately 1 million people visited the parks last year, with Elephant Butte being the largest and best known in the State.

Fishing is a year-round sport for bass, catfish, pike, and crappie. Hunting is prohibited by law in New Mexico State Parks; however, at the request of the State Game and Fish Department, the upper portion of Elephant Butte Reservoir is opened annually for hunting waterfowl, dove, quail, and big game in season. Within the marsh area, the Bureau of Land Management manages an area for threatened wildlife species.

The Rio Grande Project is one of 10 Reclamation projects to reach the "billionaire" class in agricultural production by recording a cumulative gross value in excess of \$1 billion. During 1976, the project delivered 375,070 acre-feet of irrigation water to water users in the Elephant Butte Irrigation District in New Mexico and the El Paso County Water Improvement District No. 1 in Texas, irrigating 137,485 acres. Also the Hudspeth County Conservation and Reclamation District No. 1 received supplemental irrigation water for 15,242 acres under its contract to receive drainage water.

The total gross value of crops produced on the Rio Grande Project during 1976 was over \$88 million for an average of \$576.36 per acre. Wheat, alfalfa, and cotton accounted for almost two-thirds of the production value; but vegetables and nuts continued to be the most profitable per acre, especially lettuce. Peppers, onions, and potatoes followed close behind.

There is evidence that the mild climate, rich soil, and easily accessible irrigation water of the Rio Grande Valley have attracted human habitation for many hundreds of years. When the Spanish explorers arrived in the valley in the first half of the 16th century, they found the Pueblo Indians irrigating crops, using primitive methods which persisted with the descendants of the Spaniards until the early part of the 20th century.

American settlers who arrived about the middle of the 19th century did construct some canals and simple diversions along the Rio Grande. These primitive structures, however, were a constant source of annoyance until they were replaced by the more sophisticated structures of the Rio Grande Project. Irrigation water from the project and improved farming techniques have transformed the desert-like area into a lush, productive landscape—the green ribbon from the Mexican border north described by Astronaut John Glenn as he reentered the Earth's atmosphere and passed over New Mexico.

Wayne Cunningham, manager of the Elephant Butte Irrigation District, recalls that he was working on an arroyo project as he listened to an account of the first orbital flight in 1962 and

heard Glenn's description of the irrigated project lands. Cunningham started working for the district in 1958 and assumed duties as manager in 1969. He estimates his district was responsible for approximately one-third of the agricultural production in the State of New Mexico during 1976.

***Approximately
1 million people
visited the parks last
year, with Elephant
Butte being the
largest and best
known in the State.***

George Moseley has been manager of the El Paso County Water Improvement District No. 1 since 1969. He feels that the principal benefit of the project is irrigation—with the reservoirs making it possible to hold water for the year's needs and release it as needed. The mild climate allows an irrigation season of 7 or 8 months' duration.

The United States contracted with the Elephant Butte Irrigation District and the El Paso County Water Improvement District No. 1 (originally called water users' associations) in 1906 for repayment of construction charges of the Rio Grande Project. Adjustments and credits were made over the years to the contracts, but both districts have now paid out their original obligations to the United States.

From a total investment of around \$30 million, of which more than one-third has been reimbursed by water users, the Rio Grande Project has returned over \$1.75 billion in agricultural production and sustained the lives of more than one generation of many thousands of families.

Managers Cunningham and Moseley both agree—"This is what Reclamation is all about!"

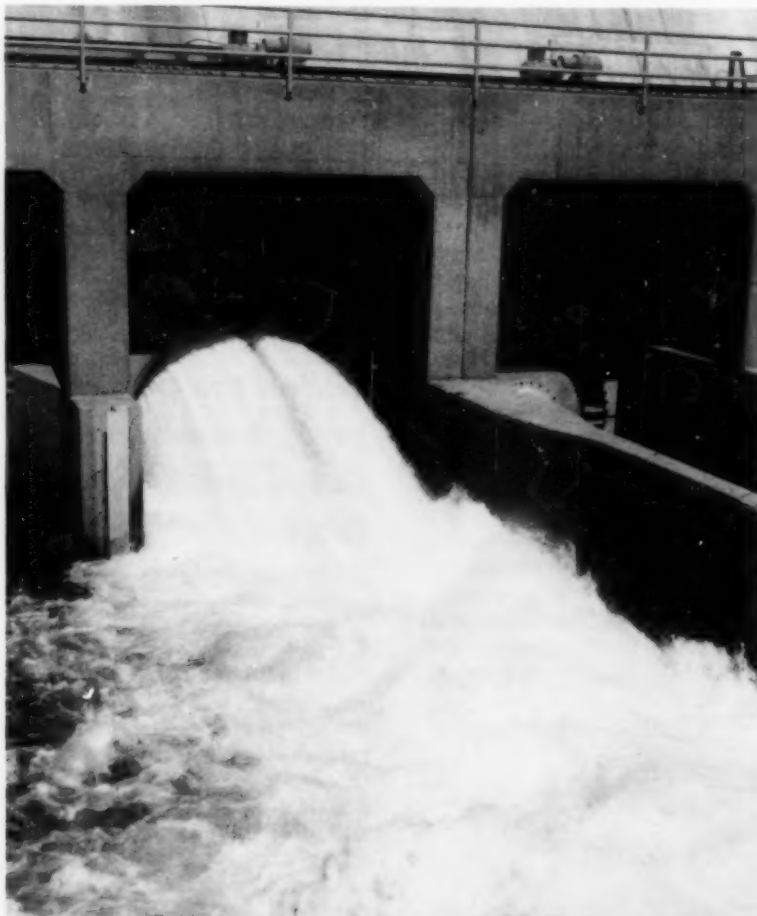
Water Quiz



24 Water Quiz

1. In what two areas of the world did irrigated agriculture first begin in 3500 B.C.?
2. Ice is more dense than water. True or False
3. Pure water contains:
 - a. hydrogen and oxygen plus 33 different forms of hydrogen and oxygen
 - b. hydrogen and oxygen only
 - c. 75% hydrogen and 25% oxygen
4. Water is found in all three of its forms—ice, vapor, and liquid—on only three planets. Name them.

Answers to Water Quiz on page 32





Employees in the News



Darrell Webber

Webber Named UC Assistant Regional Director

Darrell Webber has been named Assistant Regional Director of Reclamation's Upper Colorado Region.

He began his career with Reclamation in 1957, working on general engineering assignments and directing the successful development of computer systems for specialized technical Bureau programs. In 1972 he was named Chief of the Division of Data Processing at the Engi-

neering and Research Center in Denver.

Webber is a civil engineering graduate from the University of Kansas, and has completed graduate studies at the University of Colorado and Colorado State University. He is also a graduate of the Federal Executive Development Program. This 1½-year program, sponsored by the Office of Management and Budget and the Civil Service Commission, is especially designed to prepare selected employees for high level positions.



Clifford I. Barrett

Cliff Barrett Named Energy Representative

Clifford I. Barrett, Assistant Commissioner—Planning and Operations, has been designated to serve as the Bureau of Reclamation's representative on the United States National Committee (USNC) of the World Energy Conference. Everett Wallace, Acting Chief, Division of Power, will serve as the alternate to Barrett.

The USNC was organized

over 50 years ago in connection with the first World Power Conference held in 1924 in London. Since 1971, the USNC has conducted National Energy Forums in the United States to air key views, opinions, and recommendations of energy policy leaders.

The USNC is composed of primary leadership elements of this Nation's energy activities. A fundamental objective of the USNC is to provide for broad consideration of energy use and conservation as they relate to the total energy picture of the United States and the world.

Cutschall Named Foreign Activities Chief

Joseph A. Cutschall has been named Chief, Division of Foreign Activities. He is a 20-year Federal employee, 17 of which have been with the Bureau of Reclamation.

Cutschall began his Reclamation career in 1958 as a civil engineer in Ogden, Utah. He transferred to Collbran and Denver, Colo., before becoming Assistant Chief, Office Engineering Branch in Bangkok, Thailand in 1966. He also has served two



Joseph A. Cutschall

tours of duty in Rio de Janeiro, Brazil.

Cutschall came to the Washington office in 1973 as Chief, Training Branch, Division of Foreign Activities, and has been involved in every aspect of Reclamation's foreign activities program.

He holds a Bachelor of Science degree in civil engineering from South Dakota State University.



Robert L. McPhail

McPhail Named WAPA Administrator

Robert L. McPhail, who was named Acting Administrator of the Western Area Power Administration (WAPA) in October 1977, has been formally sworn in as Administrator of WAPA. He took his oath of office on June 19, 1978.

McPhail was formerly the Regional Director of the Bureau of Reclamation's Upper Missouri Region, headquartered in Billings, Mont. He was named to that position in November 1973.

WAPA, as part of the newly

created Department of Energy, brought under one head the power marketing and transmission facilities in a 15-State area covering mid and western America. It is organized into five area offices, eight district offices, and one operations office. The system has almost 16,000 miles of transmission lines, 256 substations, and serves 426 preference customers who in turn provide electric power to about 7 million people.

McPhail began his Reclamation career in 1963 as a civil engineer in Lewiston, Calif. In 1971 he became staff assistant to the Assistant Secretary of the Interior for Water and Power Resources. In May 1972 he was appointed Director of Interior's Southwest Energy Study. In May 1973 he was appointed Study Manager of the Northern Great Plains Resource Program.

McPhail holds a Master of Science Degree in Geological Engineering and a Bachelor of Science Degree from the University of Mississippi. He is a graduate of the Department of the Interior's Managerial Training Program.

Zeeck Named PIO for WAPA

Robert McCann Zeeck has been named Public Information Officer for the Western Area Power Administration (WAPA). He has been



Robert McCann Zeeck

Regional Public Affairs Officer for Reclamation's Upper Missouri Region in Billings, Mont., since March 1975.

He enrolled in Ohio State University in 1942. In 1943 he joined the U.S. Army. After being discharged, Zeeck completed his formal education at Columbia College in Chicago, majoring in radio and television operations and journalism.

Using the professional name of "Bob McCann" he began his broadcast career with KBYM Radio in

28 Billings. In 1957 he became sales manager at KGHL Radio-TV. In 1962 Zeeck became operator and part-owner of KMYC Radio in Marysville, Calif.

He returned to Billings in 1965 and joined the staff of KULR-TV, and was named news director in 1966.

In 1969 he was named press relations director for the "Mather for Congress Campaign." In October of the same year he was hired as a public affairs consultant for the Peace Corps in Washington, D.C. In 1970 Zeeck became special assistant for environmental quality and regional coordinator at the Federal Aviation Administration. In mid-1973 he became a private public affairs consultant prior to joining the Bureau of Reclamation.

Schuy To Head EIS Study on Acreage Limitation

Dr. David Schuy, Staff Economist at the Engineering and Research Center in Denver, has been named to coordinate a court-ordered environmental impact statement study on the proposed rules and regulations regarding acreage limitations on Reclamation projects in the 17 Western States.

The EIS study will be prepared by the Bureau of Reclamation in cooperation with the Department of



David Schuy

Agriculture.

Commissioner Higginson has asked each of Reclamation's seven regions to designate a coordinator who will work with Schuy in developing materials for the study. Preparation of the EIS has already begun with the compiling of necessary materials and the developing of a preliminary study outline.

Under the plan proposed, the EIS will be based on an analysis of carefully selected projects and districts which will be representative of the impact the rules and regulations will have on a Reclamation-wide basis.



L. W. Lloyd

Even though it will be given the highest priority, the study may take a year to develop a draft of the EIS and several more months to finalize it, Commissioner Higginson said.

Lloyd Named Regional Director

L.W. Lloyd has been named Regional Director of the Upper Missouri Region, headquartered in Billings, Mont. He succeeds Robert L. McPhail, who was appointed Administrator of the Western Area Power Administration (WAPA).

Lloyd has been Assistant Regional Director in the Upper Missouri Region since 1975. He began



Neil Parrett

his Reclamation career in Denver as an electrical engineer in 1961.

He is a graduate of Worcester Polytech in Massachusetts, with a Bachelor of Science Degree in electrical engineering.

Neil Parrett Named Chief, Division of Dam Safety

Neil F. Parrett has been named Chief, Division of Dam Safety, for the Bureau of Reclamation.

Parrett's responsibilities include the formulation of general policy guidelines for the evaluation and oversight of Reclamation's safety of dams activities involved in the Plan-



N. W. (Bill) Plummer

Design-Construct-Operate-Maintain process (PDCOM); preparation of legislative proposals further implementing the program; and review of public involvement and State participation in the PDCOM process.

Although Parrett will be stationed in Washington, D.C., his duties will have him traveling for site investigations throughout the 17 Western States.

Parrett is a native of Kansas City, Mo. He moves from the U.S. Corps of Engineers to the Bureau of Reclamation with extensive experience in dam design, construction and operation, soil mechanics, and

ground and foundation stabilization. 29

He is a civil engineering graduate from the University of Kansas at Lawrence. He has also completed graduate study in engineering at Kansas and Harvard Universities, and in government administration at Park College, Parkville, Mo.

Plummer Named Regional Director

N.W. (Bill) Plummer has been named Regional Director of the Upper Colorado Region, headquartered in Salt Lake City, Utah.

Plummer, a Reclamation employee since 1960, served as Assistant Regional Director for the Lower Missouri Region since 1974. He succeeds David L. Crandall, who retired in December 1977.

Plummer began his Reclamation career as a civil engineer at Boulder City, Nev. He worked at the Yuma, Ariz., Projects Office prior to moving to Washington, D.C., in 1968 to work in the Office of Management and Budget.

From 1971 to 1974, he worked in the Office of the Secretary of the Interior where he was involved with formulating and implementing water policies and programs.

Plummer is a graduate of the University of Vermont with a B.S. Degree in civil engineering. He received a Masters Degree from Stanford University in 1967.

30 News Notes

Commissioner Declares 1978 Normal Water Supply Year

Above normal precipitation in most parts of the West since November 1977, and forecasts calling for normal or above-normal spring runoff have prompted Commissioner R. Keith Higginson to announce that the 1976-77 drought is officially over for most areas in the 17 Western States.

The announcement triggered the process for beginning the repayment of loans made under the Emergency Drought Act of 1977 with the exception of those loans made to individual irrigators under a memorandum of understanding with the Farmers Home Administration, Department of Agriculture.

According to the Interior Department's rules and regulations interpreting the Act, repayment is required to begin not later than the first year following a year of normal water supply.

Thus, most of those who contracted for emergency loans, and those who had loan payments deferred because of the drought, will begin repayment in 1979.

Repayment of \$4.9 million in loans to individual irrigators will be made according to schedules under individual agreements with the Farmers Home Administration.

Reclamation's YACC Program Scheduled to Begin

The Bureau of Reclamation has scheduled the opening of 12 Young Adult Conservation Corps (YACC) camps this summer. A total of 940 enrollees is expected.

Camps are opening in Billings, Mont.; Boise, Idaho; Casper, Wyo.; Fresno, Calif.; Las Vegas, Nev.; Loveland, Colo.; McCook, Nebr.; Chickasha, Okla.; Tucumcari, N. Mex.; Sacramento, Calif.; Salt Lake City, Utah; Yuma, Ariz.

The YACC was created in August 1977 by the Young Employment Demonstration Projects Act, and is scheduled to last through early 1979. The pro-

gram is open to both men and women between the ages of 16 and 23. The purpose is to provide employment to an estimated 22,000 people for one year.

The YACC will have work projects similar to the old Civilian Conservation Corps of the thirties, such as erosion control and natural resource management and maintenance on federal land and waterways.

In addition to these 12 YACC camps, the Bureau of Reclamation is operating 48 Youth Conservation Corps Camps and 4 Job Corps Camps in 1978.

\$1.5 Million Contract for Cloud Seeding Study

The Bureau of Reclamation has awarded a \$1.5 million contract to the Institute of Atmospheric Sciences at South Dakota School of Mines and Technology for a series of statistical studies that will help the Bureau develop an experimental design and methods of evaluating the effectiveness of HIPLEX, its High Plains Cooperative Program in cloud seeding research.

Under the 4-year contract, Dr. Arnett Dennis will lead a team of more than a dozen scientists in developing recommendations on how Reclamation should proceed with the experiment. The design, a plan of seeding procedures to assure increased knowledge and acquire statistical evidence that seeding is effective, will be drawn by the Bureau's atmospheric scientists. Once a design is drawn, the Institute will evaluate its effectiveness and suggest ways of improving the procedures throughout the experiment.

The experimental part of HIPLEX is expected to get underway in the spring of 1979. While Reclamation is responsible for HIPLEX's atmospheric research, the State governments of Montana, Kansas, and Texas are cooperating in environmental studies and are conducting related research.

BuRec Issued \$148 Million in Bid Calls This Summer

More than \$148 million worth of construction and bid invitations were issued by the Bureau of Reclamation during the summer months of June, July, and August.

Six equipment invitations accounted for nearly \$18 million, while 67 construction invitations totaled more than \$130 million. The five largest construction invitations, located in Arizona, California, and Nevada, accounted for nearly half of the three-month outlay.

Among the five largest were two for construction of Reach 3 and Reach 8 of the Granite Reef Aqueduct on the Central Arizona Project.

The Central Valley Project accounted for two large construction invitations. One, for the 56-meter-high earthfill Sugar Pine Dam near Foresthill, will use metric (SI) units of measurement. The other invitation was for construction of Reach 8 of the Tehama-Colusa Canal.

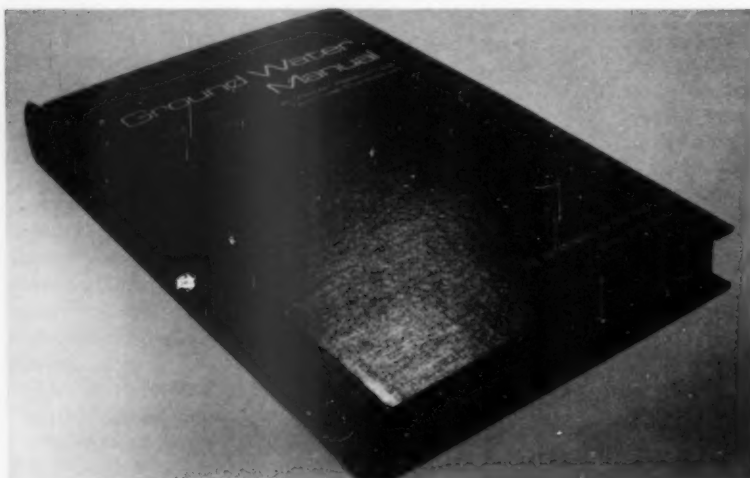
The fifth major construction invitation issued was for the construction of pumping plants on the Southern Nevada Water Project in the Las Vegas-Boulder City area.

Bulletins that include details of each invitation issued are available from the Specifications Branch, code 1330, Bureau of Reclamation, Engineering and Research Center, Building 67, Denver Federal Center, Denver, Colo. 80225.

Reclamation Library



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RECLAMATION LIBRARY Bureau of Reclamation Publishes New Ground Water Manual

A new guidebook, presenting information on the investigation, development, and management of ground water resources, has been published by the Bureau of Reclamation and is available for purchase at \$9.25 each.

Copies can be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20240; or the Bureau

of Reclamation, Engineering and Research Center, P.O. Box 25007, Denver Federal Center, Denver, Colo. 80225.

This illustrated first edition titled the *Ground Water Manual* deals with such subjects as ground water occurrence and flow, ground water investigations, aquifer yields and geophysical investigations. Also, permeability tests, well design, dewatering systems, well drilling and sterilization, and pumps are discussed in its 500 pages. An extensive bibliography and an SI metric appendix are included in the manual.

Answers to Water Quiz

1. Tigris-Euphrates Valley in Mesopotamia and Nile Valley of Egypt.
2. False. Water molecules in ice are held in a relatively rigid geometric pattern by their hydrogen bonds, producing an open porous structure. Liquid water has fewer bonds, more molecules can occupy the same space, making liquid water more dense than ice. That is why ice floats.
3. a, This was discovered by Dr. Harold Urey in 1934.
4. Mars, Earth, Venus.

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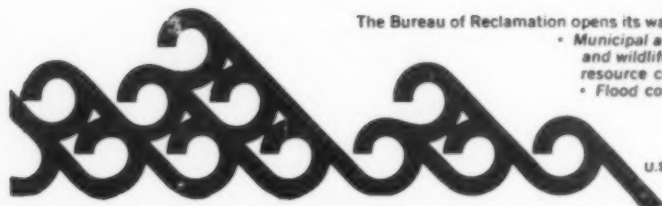
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